



# KUTWELL®

## Soluble Cutting Oil

### Product Description

KUTWELL is the trademark for a line of two high-performance "soluble" cutting fluids for cooling and lubricating the tool and work in machining operations. The line includes one petroleum-base fluid, KUTWELL 40, and one semi-synthetic fluid, KUTWELL 82.

KUTWELL products mix readily into water to form stable emulsions. They have excellent rust-preventive properties, both are inhibited against foaming, and both are versatile products suitable for a wide range of metal cutting and grinding operations. KUTWELL products effectively remove heat from the work piece and can be applied as a stream or in mist form.

In many cases, the proper KUTWELL grade can replace straight mineral cutting oils, and a single grade may often serve all the machine tools in a plant.

### Features & Benefits

Available in one petroleum-base grade and one semi-synthetic grade, they offer the following features and advantages:

- Excellent emulsion stability
- Excellent rust protection
- Outstanding lubricating properties
- Dependable cooling of tool and work

### Applications

KUTWELL water-mix cutting and grinding fluids are suitable for a wide range of ferrous and non-ferrous metalworking operations.

KUTWELL 40 is a premium quality soluble oil offering outstanding emulsion stability and rust inhibition. It emulsifies easily and resists oil-water separation in adverse operating conditions, such as poor water quality or contamination with dirt or tramp oil. KUTWELL 40 also contains a bactericide to help guard against the formation of objectionable odors. Diluted as a 95:5 water-oil mixture, it can also be used as a fire-resistant hydraulic oil. Additionally, manufactured parts can be cleaned and protected against rusting by immersing them in a KUTWELL 40 emulsion at 66-82 °C, then allowing the parts to dry.

KUTWELL 82 is a water-soluble, biostable semi-synthetic product particularly recommended for light-to-moderate machining operations. It mixes easily with water, with little or no agitation, forming a translucent blue cutting fluid. The inherent lubricity of its chemical base assures effective lubrication under moderate-duty cutting or grinding of cast iron, steel, copper and most aluminum alloys.

In most applications, KUTWELL 82 lubricates more effectively at higher water dilution ratios than conventional soluble oils. This provides superior cooling performance and, in some machining operations, higher production rates.

#### ExxonMobil Lubricants & Specialties

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The excellent rust-preventive properties of KUTWELL 82 derive from the combined effect of two additives. One provides a protective film that physically coats the metal surface. The other, a polar material, forms a supplemental film that preferentially attaches to the metal surface.

KUTWELL 82 is safe, clean, and pleasant to use. It exhibits excellent chemical and physical stability in service. It has inherent resistance to rancidity and inhibits the growth of mold and bacteria. It does not have an oily feel when spilled on surrounding surfaces.

For grinding, dilution ratios range from 30:1 to 80:1, with 50:1 a fair average for all ferrous materials. Dilutions for typical cutting operations range from 10:1 to 40:1 -- averaging about 25:1. Stronger concentrations are required for difficult operations, e.g., 5:1 to 15:1 for threading stainless steel.

Note : Because KUTWELL 82, as delivered, contains water, it is necessary to keep the product from freezing.

#### Preparation of Soluble Oils

Soluble oils are prepared for use by mixing them with relatively large portions of water. Note: To achieve a stable emulsion, always add oil to water - never add water to oil. For best emulsion stability and protection against rust and bacterial growth, use deionized or low hardness water (<100ppm). Begin by stirring one part oil into four parts water. Next, add water to this mixture to reach the desired dilution. The oil-water ratio may change during operation due to water evaporation and the filter's removal of oil attached to fine particles. Thus, it is important to regularly sample the oil concentration. This can be done by drawing off a representative sample in a graduated glass cylinder and breaking the emulsion with a saturated salt solution, such as Epsom salts. The oil concentration can easily be observed. Alternatively, the emulsion strength can be estimated by means of hand-held refractometers. Avoid storing soluble oils below freezing temperatures. If freezing should occur, re-warm the emulsion to room temperature and mix well before using.

## Typical Properties

KUTWELL	40	82
Color, ASTM	2.0	(Clear Blue)
Density @ 15°C (kg/L)	0.89	1.00
Emulsion Stability	Excellent	Good
Pour Point, °C	-6	32 (Freezing)
Viscosity, cSt @ 40 °C	35	39

## Health & Safety

Care should be taken to prevent metalworking fluids from coming in contact with the skin or splashing into the eyes. Oils and greases in contact with skin can result in plugging of sweat glands and hair follicles. In the castoff soluble oil, some defatting of the skin may occur. These conditions may lead to skin irritation or dermatitis. Accordingly, good personal hygiene should always be practiced. Oils, greases, and other foreign materials should always be removed from the skin promptly. Where repeated skin contact occurs, protective skin creams, such as silicone-base creams, applied to clean hands prior to contact may be beneficial. KUTWELL fluids are readily removed from the skin by waterless hand cleaners followed by washing with soap, water, and a soft skin brush.

Soiled clothing should not remain in contact with the skin. KUTWELL fluids can be removed from clothing by dry-cleaning or by washing with laundry detergents. Neat (unemulsified) metalworking oils, especially those containing high concentrations of emulsifiers or rust inhibitors, present a potential hazard to the eyes if allowed to enter and remain in contact with the eyes. When diluted to water-oil ratios of 20:1 or greater, however, the effects are slight and transient. As a precaution when handling KUTWELL fluids, safety glasses, a face shield, or similar protection should be worn and normal safety practices followed. If the fluid is splashed into the eyes, immediately flush the eyes for 15 minutes with water. The eyes should be protected in any case during machining operations, because the fluid in use is normally contaminated with fine metal chips or abrasive particles.

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KUTWELL products do not contain nitrosamines, phenols or nitrites. However, KUTWELL 82 contains an amine-type emulsifying agent.

**WARNING:** "Empty" containers retain residue (liquid and/or vapor) and can be dangerous. Do not pressurize, cut weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition; they may explode and cause injury or death. Do not attempt to clean since residue is difficult to remove, and even a trace of remaining material constitutes an explosive hazard. "Empty" drums should be completely drained, properly bunged, and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

Additional important health and safety information on this product can be found in the Material Safety Data Sheet which is available online at [www.exxon.com](http://www.exxon.com) or by contacting Exxon Branded Lubricants, ExxonMobil Lubricants & Petroleum Specialties Company, North America Technical Services - MSDS, 3225 Gallows Road, Fairfax, VA 22037.

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